

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A reticle substrate comprising a pair of main surfaces opposing each other, two pairs of side faces that are right to the main surfaces and that are opposed in pair to each other, and chamfered surfaces between the main surfaces and the side faces, wherein:

at least one of the main surfaces has a flatness not greater than 0.5 μm on a flatness measuring area which is laid inside of an intermediate area of 3mm located within a boundary between the at least one main surface and the chamfered surface;

~~flatness is not greater than 0.5 μm on a flatness measurement area of each main surface, from which an area of 3mm laid inwardly from a boundary between the main surface and the chamfered surface is excluded, while the boundary between the at least one main surface and the chamfered surface has a maximum height between -1 and 0 μm (excluding 0 μm) from a reference surface determined in relation to the flatness measuring area disposed inside of the intermediate area; and~~

the intermediate area between the flatness measuring area and the chamfered surface is declined or lowered from the flatness measuring area towards the chamfered surface.

2. (currently amended): A mask blank comprising a thin film for a transfer pattern, on the at least one of the ~~a~~ main surfaces of the reticle substrate according to claim 1.

3. (original): The mask blank according to claim 2, wherein the thin film has a film stress of 0.5 Gpa or less.

4. (currently amended): The mask blank according to claim 2 or 3, wherein the flatness is not greater than 0.5 μm on a flatness ~~measurement~~ measuring area of the main surface on which the thin film is formed, with ~~an~~ the intermediate area of 3mm which is laid inwardly from the boundary between the main surface and the chamfered surface and which is exempted from the flatness ~~measurement~~ measuring area, while the boundary between the main surface and the

chamfered surface has the maximum height between -1 and 0 μm from the reference surface determined in relation to the flatness measuring area laid inside of the intermediate area; and

wherein:

the intermediate area between the flatness measuring area and the chamfered surface is lowered from the flatness measuring area towards the chamfered surface.

5. (currently amended): A method for manufacturing the reticle substrate according to claim 1, characterized by the steps of:

grinding and precisely polishing a main surface of a reticle substrate;

thereafter measuring a surface configuration of the main surface on an area that includes a substrate peripheral portion to be supported by a substrate-holding member of an exposure apparatus; and

modifying the surface configuration of the main surface on the basis of a result of the measurement so that the surface configuration of the main surface becomes a desired shape, by finding that an area of the main surface is convex relative to an optionally determined reference plane, by providing, on the area, a pressure higher than the other areas onto polishing pads of a polishing apparatus, with a polishing liquid being supplied towards the polishing pads, and by moving the reticle substrate relative to the polishing pads.

6. (original): The method for manufacturing the reticle substrate according to claim 5, wherein the above-mentioned precisely polishing step comprises:

a roughly polishing process of removing surface defects of the substrate while maintaining the flatness obtained in the grinding process by using a relatively large abrasive grain; and

a mirror-polishing process of polishing the surface of the substrate for mirror finish by using a relatively small abrasive grain.

7. (original): A method for manufacturing the mask blank by forming a thin film as a transfer pattern on a main surface of the reticle substrate manufactured by the method according to claim 5 or 6.

8. (original): The method for manufacturing the mask blank according to claim 7, comprising:

a heating process of suppressing that change of the maximum height from the reference plane which appears during or after the forming of the thin film, at the boundary between the main surface and the chamfered surface, the heating process being carried out before and after the forming of the thin film.

9. (currently amended): A reticle substrate comprising a pair of main surfaces opposing each other, two pairs of side faces right to the main surfaces wherein the two side faces of each pair opposing each other, and chamfered surfaces between the main surfaces and the side faces, wherein:

at least one of the main surfaces has a flatness not greater than 0.5 μm on a flatness measuring area which is laid inside of an intermediate area of 3mm located within a boundary between the main surface and the chamfered surface;

~~a flatness is not greater than 0.5 μm on a flatness measurement area of each main surface, from which an area of 3mm laid inwardly from a boundary between the main surface and the chamfered surface is excluded,~~ while ~~the~~ a boundary between the flatness-measuring area and a flatness non-measuring area has a maximum height between -1 and 0 μm from a reference surface determined in relation to the flatness measuring area laid inside of the intermediate area; and

wherein:

the intermediate area between the flatness measuring area and the chamfered surface is lowered from the flatness measuring area towards the chamfered surface.

10. (currently amended): A mask blank comprising a thin film functioning as a transfer pattern formed on at least one of the ~~a~~ main surfaces of the reticle substrate according to claim 9.

11. (previously presented): The mask blank according to claim 10, wherein the thin film has a film stress of 0.5 Gpa or less.

12. (currently amended): The mask blank according to claim 10 or 11, wherein the flatness is not greater than 0.5 μm on a flatness ~~measurement~~ measuring area of the main surface on which the thin film is formed, with ~~an~~ the intermediate area of 3mm which is laid inwardly

from the boundary between the main surface and the chamfered surface and which is exempted from the flatness measurement measuring area, while the boundary between the flatness measuring area and the flatness non-measuring area has the maximum height between -1 and 0 μm from the reference surface determined in relation to the flatness measuring area laid inside of the intermediate area; and

wherein:

the intermediate area between the flatness measuring area and the chamfered surface is lowered from the flatness measuring area towards the chamfered surface .

13. (currently amended): A method for manufacturing the reticle substrate according to claim 9, characterized by the steps of:

grinding and precisely polishing a main surface of a reticle substrate;

thereafter measuring a surface configuration of the main surface on an area that includes a substrate peripheral portion to be supported by a substrate-holding member of an exposure apparatus; and

modifying the surface configuration of the main surface on the basis of a result of the measurement so that the surface configuration of the main surface becomes a desired shape, by finding that an area of the main surface is convex relative to an optionally determined reference plane, by providing, on the area, a pressure higher than the other areas onto polishing pads of a polishing apparatus, with a polishing liquid being supplied towards the polishing pads, and by moving the reticle substrate relative to the polishing pads.

14. (previously presented): The method for manufacturing the reticle substrate according to claim 13, wherein the above-mentioned precisely polishing step comprises:

a roughly polishing process of removing surface defects of the substrate while maintaining the flatness obtained in the grinding process by using a relatively large abrasive grain; and

a mirror-polishing process of polishing the surface of the substrate for mirror finish by using a relatively small abrasive grain.

15. (previously presented): A method for manufacturing the mask blank by forming a thin film as a transfer pattern on a main surface of the reticle substrate manufactured by the method according to claim 13 or 14.

16. (previously presented): The method for manufacturing the mask blank according to claim 15, comprising:

a heating process of suppressing that change of the maximum height from the reference plane which appears during or after the forming of the thin film, at the boundary between the main surface and the chamfered surface, the heating process being carried out before and after the forming of the thin film.

17. (new). The reticle substrate according to claim 1, wherein:

the flatness measuring area has a flatness not greater than $0.25\ \mu\text{m}$ while the boundary between the main surface and the chamfered area has a maximum height between $-0.5\ \mu\text{m}$ and $0\ \mu\text{m}$ relative to the reference surface.

18. (new). The reticle substrate according to claim 9, wherein:

the flatness measuring area has a flatness not greater than $0.25\ \mu\text{m}$ while a boundary between the flatness measuring area and the flatness non-measuring area has a maximum height between $-0.5\ \mu\text{m}$ and $0\ \mu\text{m}$ relative to the reference surface.

19 (new). The method for manufacturing the reticle substrate according to claim 5, wherein the modifying step is carried out so that a desired relationship could be accomplished between a flatness of the flatness measuring area and a declined degree of the intermediate between the flatness measuring area and the chamfered area.

20 (new). The method for manufacturing the reticle substrate according to claim 13, wherein the modifying step is carried out so that a desired relationship could be accomplished between a flatness of the flatness measuring area and a declined degree of the intermediate between the flatness measuring area and the chamfered area.